

## Effects of high power electronics converters on PLC signals

### ABSTRACT

The harmonics are generated by the switching operation of large power converters, such as Static Compensator (STATCOM), Static Reactive Power Controller (SVC) and UPFC. These harmonics may cover a wide range of frequencies and it can cause problems of interference with communication systems. Power Line Carrier (PLC) system is one of the systems used in transmission of signals for Tele-potations, Tele-tripping, Tele-control and speech communications. The Signal to Noise Ratio (SNR) of the PLC is based on the noise level at the input of the carrier receiver. These effects of harmonics result in overheating, extra losses in electric machines and capacitors; and over voltage due to excited resonance in the power system. The main source of disturbances resulting from harmonics has been proved to be from a high power converter. This problem becomes more complicated when harmonics are originating in many single source. These harmonics can be propagated throughout the entire interconnected power network. The interference due to large power converter will be superimposed on the background noise at lower levels causing it to reduce the SNR to an unacceptable value. This study deals with the analysis of the waveform of the converters and the methods used to reduce the noise imposed on PLC communication signal. © 2006 Asian Network for Scientific Information.

**Keyword:** Converter; Harmonic reduction; Power line carrier; Power transformer frequency; SNR